WABCO

An American-Standard Company

SERVICE MANUAL 5022

INSTALLATION AND MAINTENANCE OF STYLE "P-4" COLOR LIGHT SIGNAL

Alignment:

Exact alignment of the Style "P-4" signal is best obtained by use of the Sighting Telescope and Bracket especially designed for this purpose by the U. S. & S. Co. The application of this Sighting Telescope to the signal case is shown on Fig. 2 of the accompanying sketch. An expanding Jig E is placed inside the case as shown and expanded until the hardened points embed themselves slightly into the cast iron sides of the case. The Telescope Bracket is placed with its three machined pads against the ground edges of the case and the hook bolt D placed under the head of the pin in the Expanding Jig after which the wing nut C is tightened so as to hold the Bracket to the back of the signal case. Care *must* be exercised to see that the three machined pads on the Bracket rest on the ground edges of the case as otherwise the signal will be incorrectly aligned. The telescope is then inserted in the tapered hole in the Bracket.

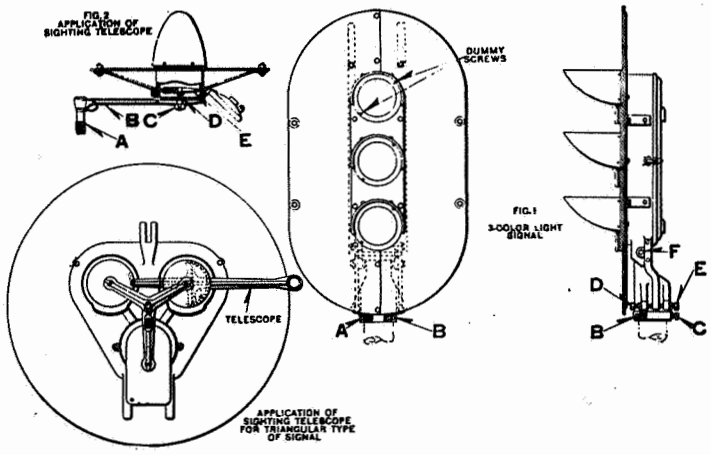
First align the signal horizontally; this is done by loosening the set screws A, B and C, Fig. 1, and shifting the socket on the pipe until the vertical cross-hair in the Telescope intersects the track at the point where the engineman should first pick up the indication. With the signal in this position the set screws A, B and C and their lock nuts should be tightened and the adjustment checked by means of the telescope to make sure that it has not been changed by the tightening of the screws. The signal should then be aligned vertically. This is done by adjusting set screws D and E until the horizontal cross-hair in the Telescope intersects the pre-determined point on the track where the engineman should first pick up the indication.

After securely locking both horizontal and vertical adjustments check with the Telescope to insure that the proper alignment has been maintained.

Alignment on Curves:

Standard Style "P-4" light signals are designed to produce a concentrated light beam for long range indication on tangent track or track of small curvature. Special "Deflecting Prisms" can be furnished when additional spread of light beam is required to properly signal track of greater curvature.

The "10 Degree Deflecting Prism" will give satisfactory results in the majority of cases. When extreme spread is required the "20 Degree Deflecting Prism" should be used.



May, 1978
A-78-1000-2212-2

PRINTED IN U.S.A.

UNION SWITCH & SIGNAL DIVISION
WESTINGHOUSE AIR BRAKE COMPANY
Swissvale, PA 15218

The prisms can be applied in the field without disturbing the assembly of the signal. Remove the two ¼" dummy screws shown in Fig. 1, from front face of the lens unit and secure the prism in place with the longer screws which are furnished with it. The nuts on the longer screws are for shipping purposes only and can be discarded when applying prisms.

Prisms are designed to spread the light beam in the horizontal plane on one side only. Care should be exercised to see that they are assembled to spread the light on the proper side to suit local conditions.

The bars in the prism will be vertical when the prism is assembled to the signal. The prism can be turned 180° spreading the light to right or left as desired. Figs. 3 and 4 show how to assemble the prism, Fig. 4 being turned 180° from Fig. 3, the light being deflected in the direction indicated by the arrows.

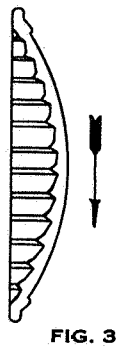


FIG. 3

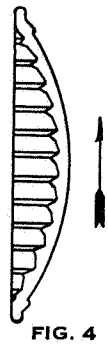


FIG. 4

To align signals on curved tracks, focus the Telescope to the far point of the curve or any other point where the indication should be first picked up by the engineman.

The prisms should be assembled to spread the beam on the side from which the engineman will view the indication approaching the signal.

Fig. 5 below illustrates how the signal is aligned and the prism applied; the signal is aligned to point "X"; the main indication is indicated by the full lines. The prism

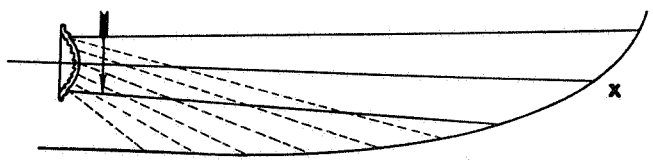


FIG. 5

is applied to deflect a portion of the beam in the direction of the arrow. This deflected light is indicated by the broken lines.

The indication should then be observed from the track to determine whether the point of maximum range has been properly selected so as to utilize the full spread of the signal to best advantage around the curve.

After satisfactory alignment is obtained securely lock all adjustments.

Check of Telescope:

The Telescope should be checked occasionally to see that the cross-hairs are on its axis. With the telescope in position as shown in Fig. 2 turn it 360 degrees keeping it tight in the tapered hole as it is revolved. If the cross-hairs are on the axis of the Telescope, the point where the cross-hairs intersect the track will stay fixed as the Telescope is revolved. If the cross-hairs have become disturbed this point of intersection will move in a circle as the Telescope is revolved in which case the signal must be aligned on the center of this circle. If the circle is small the Telescope can be used by revolving at 360 degrees and estimating the center of the circle, but if the circle is large the Telescope should be returned to the U. S. & S. Co., to be readjusted.

Lamp Renewals:

Style "P-4" lamps are accurately rebased by the U. S. & S. Co., in order to insure that the filament will be at the exact focal point when lamps are applied in the field. Thus long range indications are maintained when making lamp renewals without need of any readjustments.

In replacing lamps care must be exercised to see that the pins in lamp base are turned to the end of the slot in the receptacle and forced *up* into their seats by the contact spring. This is necessary in order to have the filament in its correct location.

Double Filament lamps are used in Style "P-4" Light Signals. Both filaments are permanently connected in multiple in the bulb. Lamps should be renewed when the first filament fails.

Lamps can be tested readily for filament failure at the relay box, by connecting the source of current through an ammeter direct to the various lamp control circuits long enough to obtain current readings. If preferred a Style "P-4" lamp can be used in place of the ammeter in which case the test lamp will burn low (half normal voltage) if both filaments of the signal lamp are good. The filament of the test lamp will not glow if either one or both filaments of the signal lamp has failed.

Voltage of Lamps:

In order to secure satisfactory service from lamps, their rated normal voltage should not be exceeded. If the range required of the signal permits, it is recommended that lamps be burned at from 10 to 20 percent under normal voltage as this will greatly increase their life. Voltage readings should be taken at the lamp terminals unless the drop in wiring is determined, which will allow readings to be made at the relay box.

Lens Units:

The optical system of the Style "P-4" Light Signal is made up in the form of complete and self-contained lens units. In case of breakage of either of the lenses or damage to the lamp receptacle, the complete lens unit should be replaced and returned to the factory for repairs.

Lens units are interchangeable in the field without need of any readjustments or realignment of the signal. Correct focusing of the units is taken care of at the factory.

To replace a lens unit, disconnect the wire leads from the lamp receptacle, take out the two cap screws that hold the unit to the outer flange of the signal casting and remove the unit complete with lenses, lamp receptacle and hood, from the front of the signal case. Clean the front surface of signal case if necessary in order that the new unit will properly seat. This is to insure that the unit will not be tilted and result in throwing the light beam in a direction differing from that of the other units in the signal case.

Cleaning Lenses:

Smoke and dust that collect on the exposed surface of the outside lens should be cleaned off from time to time in order to maintain normal range of the signal.